

Economic Activity and Unemployment Dynamics in Turkey*

Ahmet TIRYAKI

Yrd. Doç. Dr. Anadolu Üniversitesi, İİBF
İktisat Bölümü
ahmettiriyaki@anadolu.edu.tr

Havva Nesrin ÖZKAN

Arş. Gör., Bilecik Üniversitesi, İİBF
İktisat Bölümü
nesrin.ozkan@bilecik.edu.tr

Türkiyede Toplam Ekonomik Aktivite ve İşsizlik Dinamikleri

Özet

Konjonktürel dalgalanma gerçekleri ve Okun kuralı işsizliğin toplam ekonomik aktivite ile ters yönlü hareket ettiğini ortaya koyar. Bu makalenin amacı Türkiyede son zamanlarda ortaya çıkan yüksek işsizliğin nedenini ve ekonomik aktivite ile nasıl bir ilişkisinin olduğunu ortaya koymaktır. Bunu yaparken sadece bu ilişkiyi araştırmayıp, toplam çıktı açığındaki değişimlerin (GDP Gap) işsizliği ve oranını nasıl etkilediğini ve ilişkinin simetrik olup olmadığını ortaya koymaktır. Granger nedensellik testleri ilişkinin tek yönlü ve toplam çıktı açısından işsizliğe doğru olduğunu ortaya koymaktadır. Impulse response ve Variance decompositions uygulamaları da Granger nedensellik testi ile elde edilen sonuçları desteklemektedir. Çalışma sonuç olarak işsizliğin azaltılması için mikro ve makro çözüm önerileri sunmaktadır.

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Abstract

Stylized Business Cycle facts show that employment is highly procyclical and unemployment is highly countercyclical with the aggregate economic activity. Also, Okun's law indicates a negative relationship with between economic growth and unemployment rate. This paper's goal is to find out what causes high unemployment and what is the relationship between economic growth and unemployment in Turkey. It aims to show not only the relationship between cyclical output and unemployment, but also how the changes in GDP gap affect the unemployment. Further, it analyzes whether the relationship between GDP gap and Unemployment is symmetric. The results of the Granger causality test indicate that there is a unidirectional causality from GDP gap to Unemployment. Also, impulse response and Variance decompositions show that following the crises, although there is a strong and quick recovery in economic activity, but same recovery is not seen in employment and in the reduction of unemployment rate. This can be seen as a typical indication of

* Draft version of this paper participated and was presented in Anadolu University 2nd International Economics Congress, EconAnadolu2011, titled as "Economic Activity and Employment/Unemployment Dynamics during Latest Economic Crisis in Turkey".

“jobless growth” phenomena. The paper also discusses the micro and macro policy measures for reducing unemployment.

Anahtar Kelimeler: Okun kuralı, işsizlik, toplam çıktı açığı, verimlilik, Türkiye Ekonomisi.

Keywords: Okun’s law, unemployment, output, productivity, Turkey.

1. Introduction

After the 2001 financial crisis, one of the main economic problems of the Turkish economy has been the stubbornly high unemployment rates. The Turkish economy has shown a good performance in terms of economic growth after 2001 crisis but data shows that the unemployment rate level increased after year 2000 and stayed high after on. However, the recent claim about the *Turkish cyclical output and unemployment* faced structural change after 2001 crisis did not find any empirical support (See Tiryaki and Khakimov (2009)).

The previous international and Turkish economy related studies about cyclical output and unemployment mostly shows expected inverse relationship between these two variables.

This study’s goal is twofold. Firstly, it tries to show the main determinants of high and stubbornly continuous unemployment rates of Turkey. Especially it aims to find out what causes high unemployment and what is the relationship between economic growth and unemployment in Turkey. In this sense this paper separates from previous studies with its goals. It aims to show not only the relationship between cyclical output and unemployment, but also how the changes in GDP gap affect the unemployment. For the first goal of the study, the study results indicate that the main determinant of unemployment is the GDPGAP in Turkey. Especially it shows that there is a unidirectional causality from GDPGAP to Unemployment.

Secondly, the paper analyze whether the relationship between GDPGAP and Unemployment (UNEMP) is symmetric. VAR response functions and Variance decompositions test results show that after the crises while economic activity showing strong and quick recovery, same recovery is not seen in employment and in the reduction of unemployment rate. Especially the test results show that Response of the unemployment to GDPGAP shock is statistically significant and negative for a year and after four quarters (a year) becomes positive. This result indicates that the employment is not reducing as much as the reduction in output at the beginning of the downturn of the cycle for almost one year. This response could be the result of employment bubble at the peak of expansion and it would be too costly to cut employment for the firms when there is sudden reduction in aggregate demand.

Policy implications are clear when there is a unidirectional causality from GDPGAP to Unemployment. It indicates that to reduce unemployment the expansionary demand policies are necessary to increase output. Increases in cyclical output will reduce cyclical unemployment. The paper has three sections. Firstly there is literature review for international and Turkish economy cases. Then it follows the methodology. In the last section it puts forward the test results and concludes with policy implications.

2. Literature Review

The literature about the relationship between cyclical output and cyclical unemployment mainly focuses on the Okun's parameter, and asks whether Okun's law is symmetric or asymmetric. As indicated before, there exists various international and Turkish case studies, and also there exists various different results. Most of the studies show the Okun's law relationship with different parameters.

Studies using international data find different parameters and symmetrical or asymmetrical relationship during the cycle for Okun's law (See Lee (2000)). Harris and Silverstone (2000) and (2001) found no Okun's law relationship by using New Zealand data.

Cuerasma (2003) for the USA, Villaverde and Maza (2008) for Spain, Sinclair (2009) for the USA, Attfield and Silverstone (1998) for UK, Silvapulle, Moosa, and Silvapulle (2004) for the USA, Huang and Chang (2005) for Canada, Moosa (1997), Bernanke (2003), Summers (2009) and Billi (2011) found Okun's law relationship.

For Turkish economy there are also various studies about the topic. Tiryaki and Khakimov (2009) based on its "gap" specification and using different filtering methods-HP filter 1997, Baxter-King 1995, and Unobserved Component Model, different than the previous literature, found significant inverse relationship between unemployment and output for Turkey. However, the quantitative value of Okun's coefficient is relatively bigger than the developed countries' coefficient reported by original papers for whole period. However, the recent claim about the *Turkish cyclical output and unemployment faced structural change after 2001 crisis did not find any empirical support*. Also, Arabacı and Arabacı (2010), Tarı and Abasız (2010) and Yüceol (2006) by using Turkish data found asymmetric Okun's law relationship.

This paper separates from previous studies with its goals. It aims to show not only the relationship between cyclical output and unemployment also shows how changes in GDPGAP affect the unemployment. Further, the paper analyze whether the relationship between GDPGAP and Unemployment (UNEMP) is symmetric. VAR response functions and Variance decompositions test results show that after

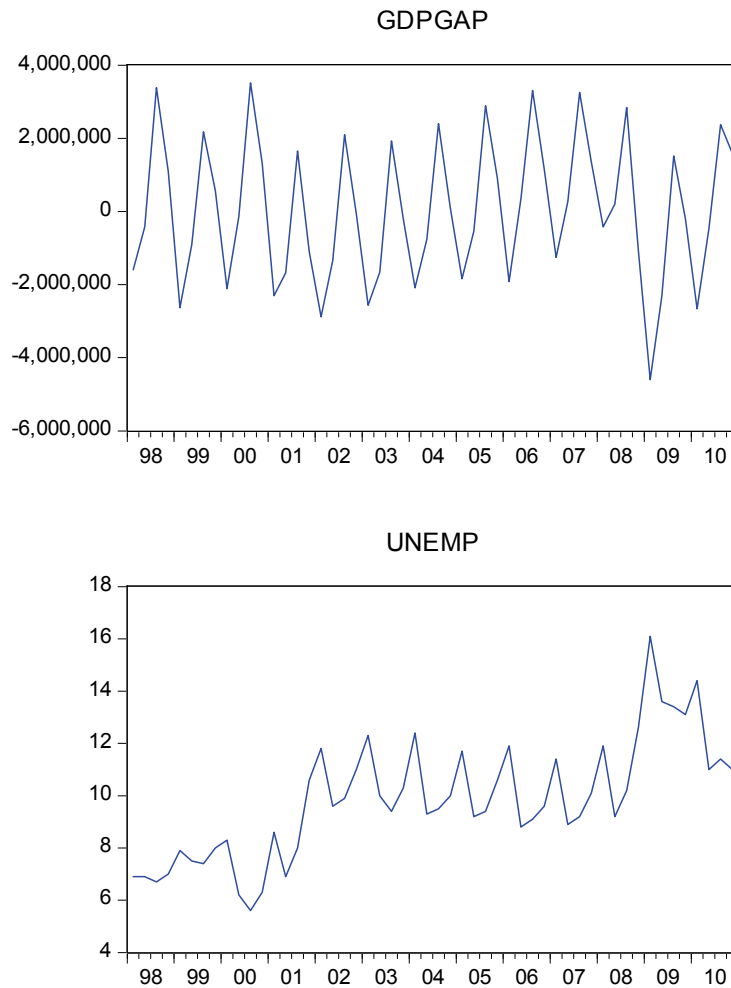
the crises while economic activity showing strong and quick recovery, same recovery is not seen in employment and in the reduction of unemployment rate. Especially the test results show that Response of the unemployment to GDPGAP shock is statistically significant and negative for a year and after four quarters (a year) becomes positive. This result indicates that the employment is not reducing as much as the reduction in output at the beginning of the downturn of the cycle for almost one year. This response could be the result of employment bubble at the peak of expansion and it would be too costly to cut employment for the firms when there is sudden reduction in aggregate demand.

3. Data, Methodology and Tests

The data used in this paper is quarterly data from CB of Turkey and Turkish DPT databases and runs from 1998:1 to 2010:4.

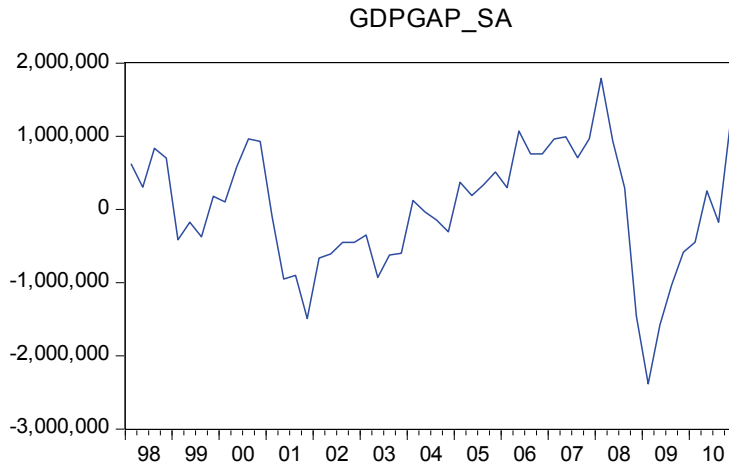
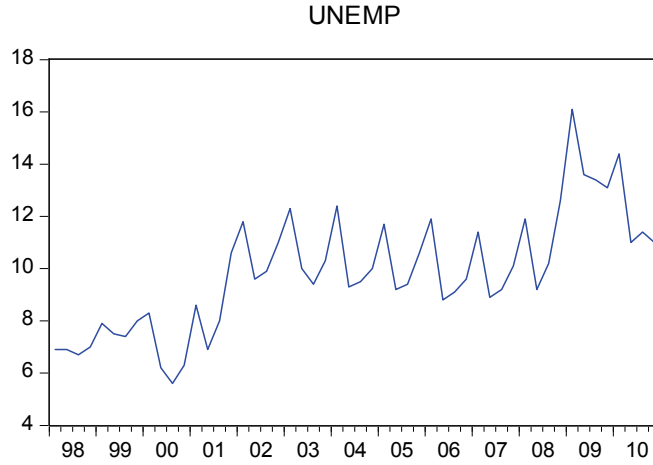
Since the paper wants to show the relationship between GDPGAP and Unemployment (UNEMP), first the GDPGAP is computed. To compute the GDP GAP, firstly trend growth of real GDP estimated by using the Hodrick-Prescott (1997) filtering. And then we compute the GDP gap by taking the difference between Real GDP and trend growth of the real GDP.

The Plots of the both GDPGAP and unemployment (UNEMP) are given by the graphs below as Graph I.



Graph 1. GDPGAP and unemployment (UNEMP)

Because the GDPGAP series exhibit clear seasonal pattern we deseasonalized the RGDP by using TRAMO/SEATS method before examining its time series properties. Below graphs (Graph 2) shows the time plots of seasonally adjusted GDPGAP and unemployment (UNEMP).



Graph 2. Seasonally Adjusted GDPGAP and unemployment (UNEMP).

Graphs of both seasonally adjusted GDPGAP-SA and Unemployment (UNEMP) indicate that both series are non-stationary. Therefore, by using Augmented Dickey Fuller (ADF) unit root test it is determined the order of the integration of both series. Results of the ADF unit root test are given in Table 1. ADF unit root test results indicate that both series are first difference stationary.

Table 1. ADF Unit Root Tests

Variable	ADF Test Statistics	Prob.
GDPGAP_SA	-2.497649	0.1220
D(GDPGAP_SA)	-6.162165	0.0000

Since both series are first difference stationary, we next investigated whether there is a cointegration between GDPGAP and Unemployment (UNEMP) by using Johansen cointegration test. Test results indicate that there is no cointegration between GDP gap and unemployment. Table 2 represents the results of the cointegration test.

Table 2. Johansen Cointegration Tests

Null Hypo.	Alternative Hypo.	Trace Stat.	Prob.	Max. Stat.	Eigen	Prob.
$r=0$	$r>0$	7.54454 4	0.515 3	6.881999		0.503 2
$r \leq 1$	$r>1$	0.66254 5	0.415 7	0.662545		0.415 7

As indicated before tests show that there is no cointegration between GDP gap and unemployment. The non-existence of cointegration allows us the use and estimate VAR.

Since the Johansen cointegration test results indicate no cointegration between GDPGAP and unemployment, we estimate VAR model of GDP and Unemployment to trace out the dynamic relations between these two variables. The table 3 shows the VAR results.

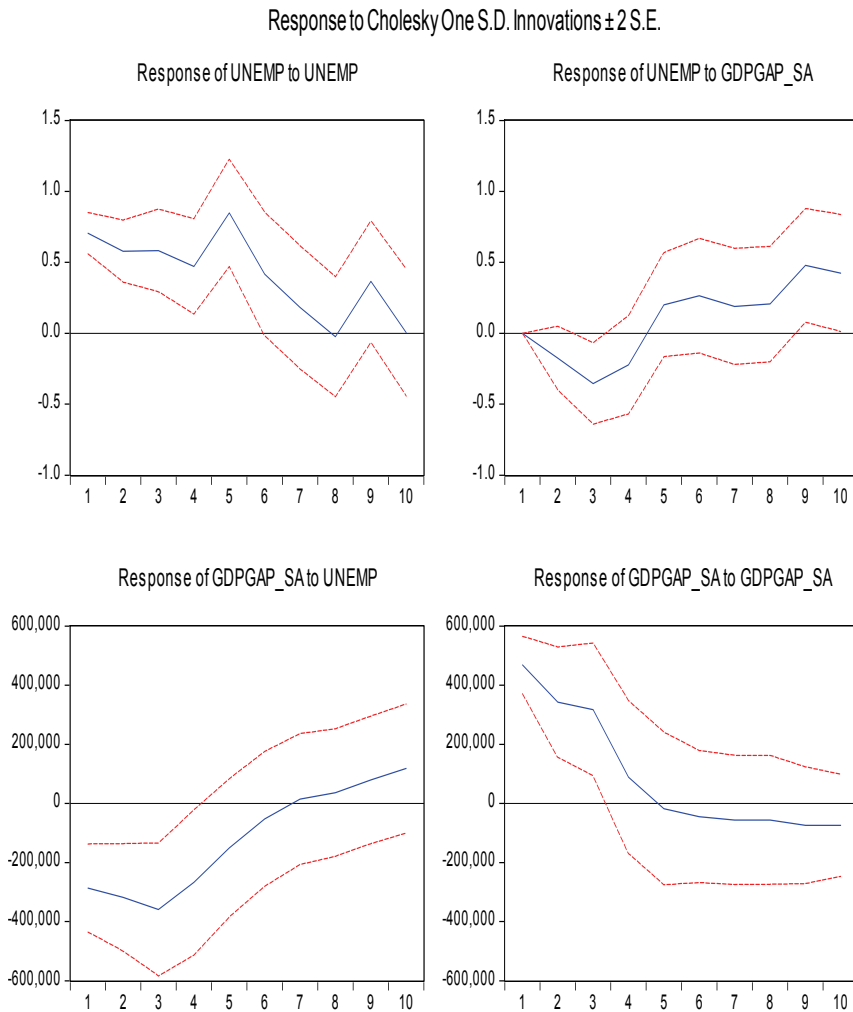
Table 3. Granger Causality Tests

Null Hypothesis	Test Statistics	Prob.
H_0 : GDP Gap does not Granger Cause Unemployment	32.57101	0.0000
H_0 : Unemployment does not Granger Cause GDP Gap	4.108174	0.5339

The results of the Granger causality test indicate that there is a unidirectional causality from GDPGAP to Unemployment reinforcing the results of the studies as indicated in the literature review.

Also, to see the relationship and the direction of the relationship between GDPGAP and Unemployment (UNEMP) impulse response and variance decompositions of these two variables are analyzed. By examining the impulse responses of UNEMP to GDPGAP and variance decompositions of UNEMP to GDPGAP, we try to analyze the dynamic relations between GDPGAP and Unemployment and to find additional supports for the Granger causality test results.

Impulse functions (Graph 3) show that Response of the unemployment to GDPGAP shock is statistically significant and negative at the beginning and after four quarters (a year) becomes positive.

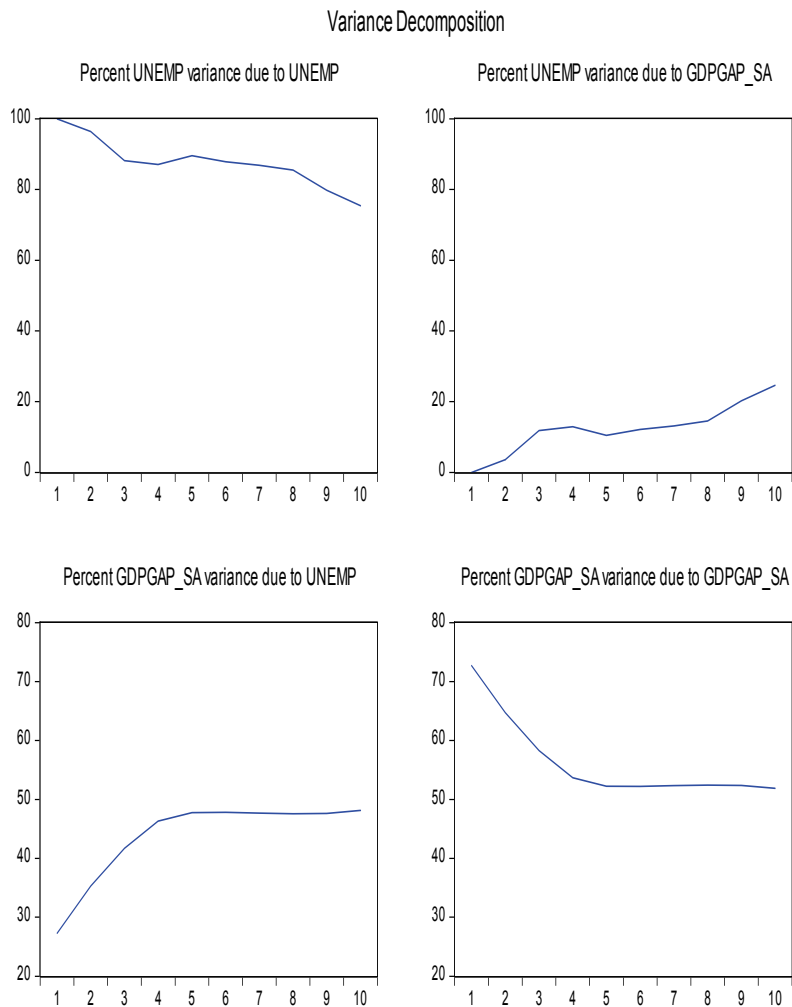


Graph 3. Impulse responses

Response of the unemployment to GDPGAP shock is statistically significant and negative at the beginning and after four quarters (a year) becomes positive. This result indicates that the employment is not reducing as much as the reduction in output at the beginning of the downturn of the cycle for almost one year. This response could be the result of employment bubble at the peak of expansion and it would be too costly to cut employment for the firms when there is sudden reduction in aggregate demand.

Also as Graph IV shows the variance decompositions reinforces the Granger causality results of unidirectional causal relationship from GDPGAP Unemployment (UNEMP).

Graph 4. Variance Decomposition



4. Results and Policy Implications

The test results indicate that the main determinant of unemployment in Turkey for the last 12 years is the GDPGAP. Especially test results show that there is a unidirectional causality from GDPGAP to Unemployment. Also, the paper analyzes whether the relationship between GDPGAP and Unemployment (UNEMP) is symmetric. VAR response functions and Variance decompositions test results show that after recessions while economic activity showing strong and quick recovery, same recovery is not seen in the reduction of unemployment rate.

Especially the test results show that response of the unemployment to GDPGAP shock is statistically significant and negative for a year and after four quarters (a year) becomes positive. This result indicates that the employment is not reducing as much as the reduction in output at the beginning of the downturn of the cycle for almost one year. This response could be the result of employment bubble at the peak of expansion and it would be too costly to cut employment for the firms when there is sudden reduction in aggregate demand.

Policy implications are clear when there is a unidirectional causality from GDPGAP to Unemployment. It indicates that to reduce unemployment the expansionary demand policies are necessary to increase output. Increases in cyclical output will reduce cyclical unemployment.

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